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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/633,602	08/04/2003	Arkady Nikitin		6423

7590 10/20/2004

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EXAMINER

YOUNG, CHRISTOPHER G

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/633,602

Applicant(s)

NIKITIN ET AL.

Examiner

Christopher G. Young

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The instant claims are drawn to a method of controlling removal of photo resist, however, no controlling process steps are claimed. The claims, as currently presented, encompass an inspection and comparison method, not a controlling method. This renders the scope of the claims confusing as to the intended metes and bounds. If a removal controlling method is the intended scope the claims need to be amended in a manner that sets forth way removal is being controlled based on the SEM measurements.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

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such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hoshino et al. (US Patent Number 6,143,473).

The instant application claim 1 is presently drawn to a method of controlling removal of photo resist. This scope is in dispute as set forth in the rejection under 35 U.S.C. 112, second paragraph, above. The scope as set forth in current claim 1 merely sets forth an inspection method using SEM to determine photo resist removal values at different points of a photo resist mask.

Hoshino et al. teach a film patterning method using resist as a mask, comprising the steps of forming a film 2 on a substrate 1, coating resist 3 on the film 2, exposing the resist 3, developing the resist 3 by a liquid phase developing solution 4, removing the liquid developing solution 4 from a surface of the film 2, irradiating ultraviolet rays onto the resist 3, which remains on the film 2 by the developing step, in an oxygen containing atmosphere, removing developed residue of the surface of the resist 3 by supplying an alkali aqueous solution 5 to the resist 3 which has remained on the film 2, and forming patterns of the film 2 by etching the film 2 exposed from the resist 3. Accordingly, the unnecessary residue of resist can be removed from the substrate in a short time after the development. In the specification it is shown that it has been examined how removal of the developed residues 3a of the resist 3 is changed according to the irradiation time of the ultraviolet ray within a series of steps of performing irradiation of the ultraviolet rays and supply of the alkali aqueous solution after the above development, results can be given by perspective sectional views shown in FIGS. 3A, 4A, 5A and 6A. These views

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shown in FIGS. 3A, 4A, 5A and 6A are depicted based on SEM photographs as shown in FIGS. 3B, 4B, 5B and 6B respectively, and the line & space resist patterns 3p having a width of 2.0.mu.m are magnified to about 15000 times.

This passage of the reference clearly shows SEM images being utilized for inspection and comparison as set forth in claim 1. The reference does not specifically show, or particularly describe, the photo resist as being a photo resist mask, or the comparison of different portions in the opening to be controlled for development. In view of this, the claim has not been rejected as anticipated by this reference. However, the claim is still prima facie obvious in view of the reference combined with the spirit of the reference and the ability of a skilled artisan. This is the case since multiple SEM pictures are taken in the prior art reference with the intended purpose of comparison. Even if it isn't stated, there isn't any purpose to taking these SEM pictures unless they are used for inspection of the specific area, and comparison to other area or a control. One of skill would also realize that based on this inspection, if the image area is under-developed that further processing is needed.

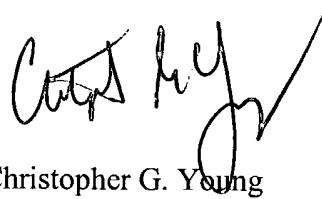
Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The additional references cited by the Examiner set forth the state of the art pertaining to SEM monitoring, or inspection, of development. No prior art rejections are being made over these references at this time in view of the current claim scope.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher G. Young whose telephone number is 571-272-1394. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F. Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Chris G. Young', with a long, sweeping horizontal stroke extending to the right.

Christopher G. Young
Primary Examiner
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cgy